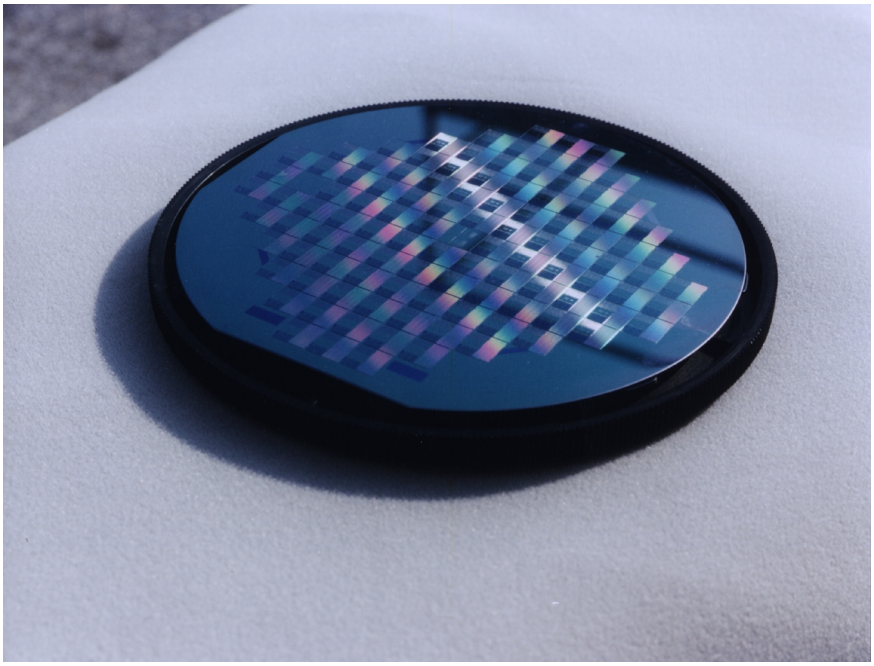
Technology Opportunity

Diffractive Optics at Marshall Space Flight Center (MSFC)

MSFC is NASA's lead center for identifying the technologies required to affordably produce space optics necessary for future missions. MSFC takes the lead in the process where NASA, other government agencies, industry, and academia identify the technologies of the future, guided by the scientifically derived strategic plans. Another of the Center's responsibilities is to successfully infuse new technology into future missions.

MSFC and the U.S. Army MICOM Research, Development, and Engineering Center of Huntsville, Alabama, have established a colocated, joint microfabrication facility at the Redstone Arsenal, where optical lithography, etching, thin-film deposition, and diamond turning capabilities are in place. The major goal of this partnership effort is to foster fabrication research and development in the areas of diffractive optics and integrated optics. Additionally, the joint-housed facility provides technical support to projects in the development and application of advanced micro-optical systems, and serves as a focal point for technology transfer between industry, government agencies, and university communities.



Potential Commercial Uses

Advancements in electro-optics have applications for optical communications; guidance and navigation instruments; atmospheric wind measurements; tracking systems; heads-up displays; laser-beam shaping for medical applications; non-mechanical, high-speed, data-readout systems; high-speed measurement of engine components; and many other uses in a wide variety of industry and commercial fields.

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Benefits

Industry, other government agencies, and academia have the potential to save a great deal of time and money as they take advantage of the expertise and capabilities at MSFC.

The Technology

The diffractive optics work being conducted at MSFC is a very promising technology for many space-based missions, including planetary discovery satellites. This technology could offer significant size and weight reductions, as well as potential increases in ruggedness and performance over standard optical systems. In addition, the diffractive optics technology enables many new and advanced microfabrication-based photonics technologies.

Where planetary discovery satellites are concerned, the area of space science may be most enabled by the introduction of diffractive optics. Diffractive optics could replace or hybridize conventional optical components to produce achromatic or athermalized optical systems. Many new and advanced microsensor technologies, such as those based on fiber optics, integrated optics, electro-optics, and micromachining are extremely well suited for diffractive optics, antireflective coatings, polarizers, spectrometers, real-time signal processing, optical interconnects, telescope aberration correction, and communications.

Contacts

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Additional information about diffractive optics and MSFC's Technology Transfer team is available on the World-Wide Web:

www.nasasolutions.com

Key Words

Diffractive Optics
Technology Transfer
Micro-Optics
Integrated optics
Diamond Turning
Thin Films
Lithographs
Etching